



UNITED STATES PATENT AND TRADEMARK OFFICE

A

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,541	10/08/2003	Chao-Hsiung Wang	N1085-00223(N1280-00225)	7285
8933	7590	03/08/2006	EXAMINER	
DUANE MORRIS, LLP IP DEPARTMENT 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103-4196			YANTORNO, JENNIFER M	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/681,541	Applicant(s) WANG ET AL.	
	Examiner Jennifer Yantorno	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10-13, 16-20, 23, 25-28, 31, 32, 34 and 35 is/are rejected.
- 7) ☒ Claim(s) 14, 15, 21, 22, 24, 29, 30 and 33 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

Claims 1-9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 02/08/2006.

Specification

The disclosure is objected to because of the following informalities: "ultra-violate" should be spelled "ultraviolet".

Appropriate correction is required.

Claim Objections

Claim 35 is objected to because of the following informalities: "the mask set" on line 6 lacks antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10, 11, 13, 16, 23, 25, 31, 32, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Ebinuma et al. (US 5,150,391).

Regarding claim 10, '391 teaches a system for concentrating high energy particle on a predetermined area on a target semiconductor substrate comprising a high energy source for generating a predetermined amount of high energy particles, an

Art Unit: 2881

electromagnetic radiation source for generating one or more low energy beams, and a mask set exposed to the high energy source and the electromagnetic radiation source, the mask set having at least one mask with at least one alignment area and at least one mask target area thereon, the mask target area passing more high energy particles than any other area of the mask, wherein the mask is aligned with the predetermined target semiconductor substrate using low energy beams, wherein the high energy particles generated by the high energy source pass through the mask target area to land on the predetermined area on the target semiconductor substrate, and wherein the predetermined area receives the high energy particles with a collective energy exceeding a predetermined threshold (Col. 3, ll. 27-59).

Regarding claim 11, '391 teaches at least one protection shield for protecting the alignment area from being exposed to the high energy particles (Col. 3, ll. 60-65).

Regarding claims 13 and 32, '391 teaches that the protection shield is attached to the electromagnetic radiation source (Fig. 3, #6a-6d and 7a-7d).

Regarding claims 16 and 25, '391 teaches that the mask target is an aperture (Col. 3, ll. 43-59).

Regarding claim 23, '391 teaches a system for forming a semi-insulator area on a target semiconductor substrate comprising a high energy source for generating a predetermined amount of high energy particles, an electromagnetic radiation source for generating one or more low energy beams, and a mask set having at least one mask with at least one alignment area and at least one mask target area thereon, the mask target area passing more high energy particles than any other area of the mask,

wherein the mask is aligned with the predetermined target semiconductor substrate using low energy beams, wherein the high energy particles generated by the high energy source with a collective energy exceeding a predetermined threshold pass through the mask target area to transform the predetermined area on the target semiconductor substrate into the semi-insulator area (Col. 3, ll. 27-59).

Regarding claim 31, '391 teaches at least one protection shield inserted between the electromagnetic radiation source and the mask set for protecting the alignment area of the mask from being exposed to the high energy particles (Col. 3, ll. 60-65).

Regarding claim 35, '391 teaches a system for forming a semi-insulator area on a target semiconductor substrate comprising a high energy source for generating a predetermined amount of high energy particles, a low energy electromagnetic radiation source for generating low energy beams, at least one protection shield inserted between the low energy electromagnetic radiation source and the mask set for protecting the alignment area of the mask from being exposed to the high energy particles, and a mask set having at least one mask with at least one alignment area and at least one mask target area thereon, the mask target area passing more high energy particles than any other area of the mask, wherein the mask is aligned with the predetermined target semiconductor substrate using low energy beams, wherein the high energy particles generated by the high energy source with a collective energy exceeding a predetermined threshold pass through the mask target area to transform the predetermined area on the target semiconductor substrate into the semi-insulator area (Col. 3, ll. 27-65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims *** are rejected under 35 U.S.C. 102(b) as being unpatentable over Ebinuma et al. (US 5,150,391), in view of Flanders et al. (US 4,254,174).

Regarding claims 12 and 34, the aforementioned prior art meets all claim limitations with the exception of a heat sink being formed on the mask. '174 teaches one or more heat sinks fixed on the mask without blocking the alignment area for dissipating heat energy generated by the high energy particles (Col. 3, ll. 38-42). It would have been obvious to one skilled in the art at the time of the invention to include heat sinks on the mask because of the substantial heat generated by ion beam etching.

Regarding claims 17, 18, 26, and 27, '174 teaches that the mask target area is made of a material that is different from the rest of the mask with an improved particle passing rate to assure that the collective energy exceeds the predetermined threshold, namely the mask target area is made of an Al based material (Col. 1, ll. 37-40).

Regarding claims 20 and 28, '174 teaches that the rest of the mask is made of a silicon oxide based material (Col.1, ll 37-42).

Claim 19 is rejected under 35 U.S.C. 102(b) as being unpatentable over Ebinuma et al. (US 5,150,391), in view of Flanders et al. (US 4,254,174), further in view of Wagner (US 4,548,883).

Regarding claim 19, the aforementioned prior art meets all claim limitations with the exception of the rest of the mask being made of a quartz based material. '883 teaches the rest of the mask being made of a quartz based material (Col. 6, ll. 51-57). It would have been obvious to one skilled in the art at the time of the invention to fabricate the rest of the mask out of quartz as this is notoriously known in the art of mask making.

Allowable Subject Matter

Claims 14, 15, 21, 22, 24, 29, 30, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: Regarding claims 14 and 33, the closest prior art does not teach a protection shield attached to the mask. Regarding claims 15 and 24, the closest prior art does not teach one or more masks with their corresponding mask target areas aligned in sequence for sequentially downsizing a resulting area for passing the high energy particles, thereby concentrating the high energy particles on the predetermined area. Regarding claims 21, 22, 29, and 30, the closest prior art does not teach that the predetermined threshold is in a range between 1 and 5 MeV, specifically 3MeV.

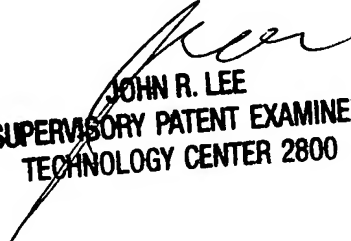
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Yantorno whose telephone number is (571) 272-5918. The examiner can normally be reached on Monday-Friday, 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JY


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800